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The Quest for Dark Matter in Dwarf Galaxies with Cherenkov Telescopes

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The problem of dark matter detection is of paramount importance for modern astrophysics, since it would allow to fully characterize the properties of the “missing” mass in the Universe. So far, in fact, its existence is only based on the indirect observations of the gravitational effects on astronomical objects. Efforts to identify plausible dark matter particle candidates essentially fail without any direct hint about their physics. Recently, a framework for the astronomical search of dark matter signals has been arising from the possibility that dark matter particles self-interact to produce Standard-Model pairs, that subsequently annihilate into final-state gamma photons. The observation of such photons is a task potentially at reach of next-generation Cherenkov telescopes. In this talk, I will illustrate the capabilities of future Cherenkov instruments to detect gamma rays from dark matter self-interaction by observing low-background, dark-matter dominated astronomical sources such as the dwarf spheroidal galaxies.

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